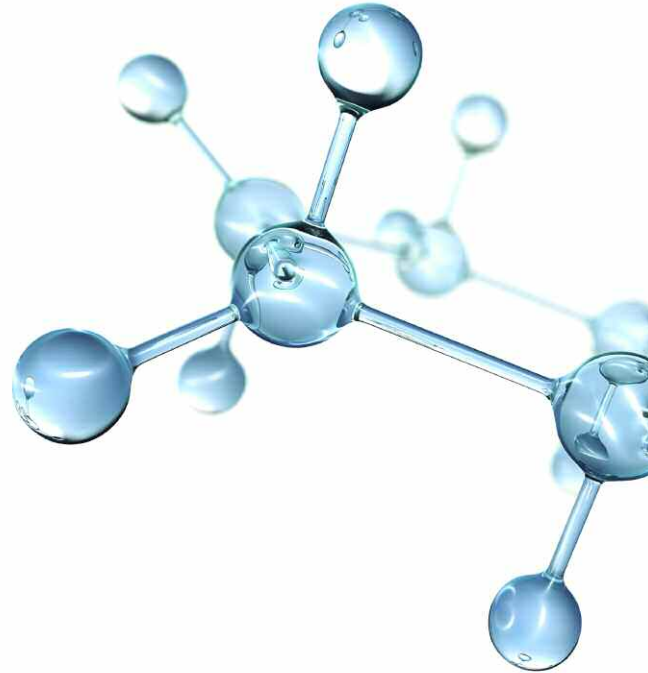


Norwegian vessel cuts engine oil consumption by more than 50%



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Just 18 months after delivery from the shipyard where she was built, *M/V Krossfjord*, a Norwegian fishing vessel that operates in the North Atlantic, began experiencing radically increased oil consumption due to lacquer formations in the engine's cylinder liners.

In conjunction with ExxonMobil Marine Lubricants and with the input of MAN Diesel A/S, the owner initiated an 8,000-hour field trial to investigate the effectiveness of Mobil Delvac 1640, as a way to solve the problem.

Based on the engine logbook, oil consumption prior to the change to Mobil Delvac 1640 was 90-100kg per day. After the changeover, consumption dropped to 45kg per day. This drop of 50%-plus translates to an annual savings in oil alone of \$10,110, according to an engineering service report from ExxonMobil.

"I was interested in controlling the lacquering, improving the engine's reliability and cutting the vessel's operating costs," says Knut W. Hamre, owner of *M/V Krossfjord*, "but we also recognised that solving the lacquer problem could yield environmental benefits — including reducing lube-related emissions, due to the reduction in oil consumption."

Technical challenge

Lacquer formation has become increasingly common in modern medium-speed engines that burn low-sulphur fuels. If left unchecked, lacquer can build up in cylinder liners, filling the honing grooves with a hard, resin-like material. These deposits can lead to scoring or polishing of the liners, requiring more frequent liner replacements. Increased oil consumption is a typical symptom.

A solution to this technical challenge is an advanced engine lubricant that can control cylinder oil lacquering formation. Mobil Delvac 1640 is one of those oils and was approved by MAN Diesel A/S in a parallel field trial. According to ExxonMobil, the engine oil increases dispersancy and reduces liner lacquering.

Inspection results

M/V Krossfjord is powered by a MAN B&W Alpha 9L27/38 and at a load of 75-80%. The engine had been operating for 3,000 hours when the field test began. Oil samples were sent at regular intervals to ExxonMobil's Signum Oil Analysis laboratory, which analyses used oil as a way to monitor the mechanical health of engines and other shipboard equipment on an ongoing basis. The 50% reduction of the engine's lube oil consumption was also a clear indication of Mobil Delvac 1640's effectiveness in combating lacquer build-up.

At the end of the 8,000-hour trial period, engineers from ExxonMobil and MAN B&W conducted a limited onboard



The cylinder inspection showed that all honing marks were clearly visible. No bore polishing or lacquering was noted.

inspection. This included a borescope inspection of all nine cylinder liners, inspection of the crankcase and camshaft housing, and evaluation of the filtration process.

The cylinder inspection showed that all honing marks were clearly visible. No bore polishing or lacquering was noted. There was slight discoloration in the number 3 cylinder liner covering a fourth of the circumference towards the front end of the engine, but honing marks were still clearly visible. No discoloration was noted in the other liners.

The combustion chamber was also inspected with the borescope. All surfaces, including the valve heads, were relatively clean, with only very light deposits.

The crankcase space was covered with small black spots that were easy to wipe off. This indicates that the oil was holding soot and contaminants in suspension, as it is designed to do. The camshaft spaces were also stained with small black spots that were easily wiped off. Cams and rollers were in good condition.

"The field test aboard *M/V Krossfjord* clearly illustrates that Mobil Delvac 1640 helps to prevent lacquer formation on cylinder liners," says Chuck Rockwell, global marine field engineering services coordinator ExxonMobil Marine Lubricants. "As a result, vessel owners can potentially save significant amounts of money due to lower oil consumption and longer time before overhauls (TBOs)."

ExxonMobil Marine Limited

An ExxonMobil Subsidiary, ExxonMobil House, Mailpoint 29, Ermyn Way
Leatherhead KT22 8UX, United Kingdom

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